

WHAT IS CLAIMED IS:

1 1. A method for protecting a target circuit, the method comprising:
2 detecting power from a source of power;
3 coupling the power to the target circuit in a gradual manner;
4 detecting noise components in the power; and
5 varying the amount of power delivered to the target circuit in response to the
6 noise component.

1 2. The method of claim 1 wherein the step of coupling includes
2 controlling the conductivity of a transistor device, the transistor device having series-
3 connection between the source of power and the target circuit.

1 3. The method of claim 1 wherein the step of coupling includes
2 controlling the conductivity of a transistor device, the transistor device having series-
3 connection between the source of power and the target circuit.

1 4. A method for protecting a target circuit, the method comprising:
2 detecting power from a source of power;
3 coupling the power to the target circuit in a gradual manner;
4 detecting when a current supplied to the target circuit exceeds a threshold; and
5 decoupling the power in response to detecting that the current supplied to the
6 target circuit exceeds a threshold.

1 5. A circuit comprising:
2 a switch configured to couple a target circuit with a source of power;
3 a first detector configured to detect power provided by the source of power,
4 the first detector operatively coupled with the switch, wherein the switch closes responsive to
5 the first detector; and
6 a second detector configured to detect noise in the power, the second detector
7 operatively coupled to the switch, wherein a conductivity of the switch varies responsive to
8 the second detector.

1 6. The circuit of claim 5 wherein the second detector couples between the
2 source of power source and a gate of the switch.

- 1 7. The circuit of claim 5 further including a positive terminal and a
2 negative terminal, wherein the switch is a transistor device having a gate, a source, and a
3 drain, wherein the second detector comprises:
4 a bias voltage source;
5 an operational amplifier having:
6 an inverting input coupled with the positive terminal and coupled with
7 the bias voltage source;
8 a non-inverting input coupled with a negative terminal; and
9 an output coupled to the gate of the switch.
- 1 8. The circuit of claim 7 wherein the output of the operational amplifier
2 couples with the first detector.
- 1 9. The circuit of claim 7 wherein the bias voltage source coupled with the
2 first detector.
- 1 10. The circuit of claim 9 wherein the bias voltage source is a voltage
2 divider.
- 1 11. A circuit comprising:
2 a switch configured to couple a target circuit with a source of power;
3 a first detector configured to detect power from a source of power, the first
4 detector operatively coupled with the switch, wherein the switch closes responsive to the first
5 detector; and
6 a second detector configured to detect when a current supplied to the target
7 circuit exceeds a threshold, wherein the switch opens responsive to the second detector.
- 1 12. The circuit of claim 11 wherein the switch closes at a slower rate than
2 it opens.
- 1 13. The circuit of claim 11 wherein the switch is characterized by having a
2 variable conductance, wherein the switch closes at a slow rate such that its conductance is
3 gradually increased.
- 1 14. The circuit of claim 11 wherein the first detector and the switch are
2 coupled to the positive terminal of the source of power.

1 15. The circuit of claim 11 wherein the first detector and the switch are
2 coupled to the negative terminal of the source of power.

1 16. The circuit of claim 11 wherein the switch comprises a first transistor
2 coupled between the source of power and the target circuit, the first transistor having a
3 control node coupled to the first detector.

1 17. The circuit of claim 16 wherein the first transistor is a FET transistor.

1 18. The circuit of claim 16 further comprising a filter, wherein the control
2 node of the first transistor couples to the first detector via the filter.

1 19. The circuit of claim 11 wherein the second detector comprises a first
2 op-amp operatively coupled between the first detector and the switch.

1 20. The circuit of claim 19 wherein the second detector further comprises a
2 resistor coupled between the first op-amps inputs.

1 21. The circuit of claim 19 wherein the second detector further comprises a
2 second power source coupled between one of the first op-amp inputs and the source of power.

1 22. The circuit of claim 11 wherein the first detector comprises:
2 a second transistor; and
3 a capacitor coupled between the conduction nodes of the second transistor

1 23. A circuit comprising:
2 a switch configured to couple a target circuit with a source of power;
3 a first detector configured to detect power from the source of power, the first
4 detector operatively coupled with the switch, wherein the switch closes responsive to the first
5 detector; and
6 a second detector configured to detect when the source of power is decoupled
7 from the target circuit, wherein the switch opens responsive to the second detector.

1 24. The circuit of claim 23 wherein the switch comprises a first transistor
2 coupled between the source of power and the target circuit, the first transistor having a
3 control node coupled to the first detector.

1 25. The circuit of claim 23 further comprising a filter, wherein the control
2 node of the first transistor couples to the first detector via the filter.

1 26. The circuit of claim 23 wherein the second detector comprises a first
2 op-amp operatively coupled between the first detector and the switch.

1 27. A circuit comprising:
2 a switch configured to couple a target circuit with a source of power;
3 a first detector configured to detect power from the source of power, the first
4 detector operatively coupled with the switch, wherein the switch closes responsive to the first
5 detector; and
6 a second detector configured to detect a voltage change from a non-zero
voltage towards a zero voltage, wherein the switch opens responsive to the second detector.

1 28. The circuit of claim 27 wherein the switch comprises a first transistor
coupled between the source of power and the target circuit, the first transistor having a
control node coupled to the first detector.

1 29. The circuit of claim 28 further comprising a filter, wherein the control
node of the first transistor couples to the first detector via the filter.

1 30. The circuit of claim 27 wherein the second detector comprises a first
2 op-amp operatively coupled between the first detector and the switch.

1 31. A circuit for coupling a power source to a device comprising:
2 first circuit means for detecting a connection event wherein a connection is
3 made between the first circuit and the power source;
4 second circuit means, responsive to the first circuit means, for varying the
5 amount of power from the power source that is applied to the device;
6 third circuit means for filtering electrical noise originating from the power
7 source to produce a filtered signal; and
8 fourth circuit means for producing a control signal responsive to the filtered
9 signal,
10 the second circuit means further being responsive to the control signal so that
11 the amount of power that is applied to the device varies in response to the electrical noise.

1 32. A circuit for coupling a power source to an electronic device
2 comprising:
3 first circuit means for detecting a connection event wherein a connection is
4 made between the first circuit and the power source;
5 second circuit means, responsive to the first circuit means, for coupling
6 power from the power source to the electronic device so that power is applied to the
7 electronic device in a gradual manner;
8 third circuit means for detecting an overcurrent event wherein the
9 electronic device draws current from the power source exceeding a predetermined level of
10 current; and
11 fourth circuit means for reducing the amount of power that is applied to
12 the electronic device in response to the third means.

1 33. The circuit of claim 32 further including fifth circuit means for
2 producing a signal indicative of an occurrence of the overcurrent event.

1 34. The circuit of claim 32 further including a first connection terminal
2 and a second power connection terminal, the power connection terminals suitable for
3 connection to the power source, the third circuit means operable to detect an overcurrent
4 event by monitoring electrical activity on only one of the first and second connection
5 terminals.

1 35. The circuit of claim 32 further including fifth circuit means for
2 detecting electrical noise in the power, the second circuit means further being responsive
3 to the fifth circuit means by varying the amount of power that is applied to the electronic
4 device.

1 36. The circuit of claim 32 wherein the fourth circuit means is effective
2 for decoupling the power supply from the electronic device.

1 37. A circuit for coupling a power source to a device comprising:
2 first circuit means for detecting a connection event wherein a connection is
3 made between the first circuit and the power source;

second circuit means, responsive to the first circuit means, for coupling power from the power source to the device, the second circuit means operable to vary the amount of power that is applied to the device;

third circuit means for detecting a change in an electrical parameter of the second circuit means indicative of a disconnection between the circuit and the power source;

fourth circuit means for decoupling the power source from the device in response to the third means.

38. The method of claim 37 further including fifth circuit means for producing a signal indicative of an occurrence of the disconnection between the circuit and the power source.

39. The circuit of claim 37 further including fifth circuit means for detecting electrical noise in the power source, the second circuit means further being responsive to the fifth circuit means by varying the amount of power that is applied to the device.

40. A circuit for coupling a power source to a device comprising:
first circuit means for detecting a connection event wherein a connection is made between the circuit and the power source;

second circuit means, responsive to the first circuit means, for providing a varying amount of power from the power source to the device;

third circuit means for detecting when the device draws current from the power source exceeding a predetermined level of current;

fourth circuit means for decoupling the power source from the device in response to the third means;

fifth circuit means for detecting a change in an electrical parameter of the second circuit means indicative of a disconnection between the circuit and the power source; and

sixth circuit means for decoupling the power source from the device in response to the fifth means.

- 1 41. The circuit of claim 40 further including seventh circuit means for
2 detecting electrical noise in the power, the second circuit means further being responsive to
3 the seventh circuit means by varying the amount of power that is applied to the device.